NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

F A C T S H E E T
(Pursuant to NAC 445A.236)
August 2004

PERMITTEE NAME: City of Carlin
Post Office Box 787
Carlin, Elko County, Nevada 89822

PERMIT NUMBER: NEV93001

LOCATION: City of Carlin Wastewater Treatment Facility
101 South Eighth Street
Carlin, Elko County, Nevada 89822

Latitude: 40°42'50" North
Longitude: 116°05'40" West

FLOW: 30-Day Average: 0.5 million gallons per day
Daily Maximum: 0.9 million gallons per day

PUBLIC WATER SUPPLY: Within 7,000-foot buffer zones for:
Carlin Honor Camp, Nevada Department of Corrections;
Private Well, designated Sharons; and
Private Well, Dovetail Ranch.

Contacts listed for the identified pumping wells are sent individual notices of the proposed discharge.

GENERAL:

The Carlin Wastewater Treatment Facility uses aeration and facultative treatment to settle, digest, and decompose up to 0.9 million gallons per day of domestic wastewater from residential and commercial properties in the City of Carlin. The 30-day average design flow is 0.5 million gallons per day.

Fundamental elements of the treatment system include a wet well with a barscreen for bulk material removal, aeration in a primary lagoon (Lagoon Cell 1), and facultative treatment in a secondary lagoon (Lagoon Cell 2). Both lagoons are clay (bentonite) lined and have holding capacities of 16.3 million gallons (10 acres) and 11 million gallons (8.4 acres) in Lagoon Cell 1 and Lagoon Cell 2, respectively.

Wastewater is treated to meet secondary treatment standards before discharge to: (1) cultivated irrigation fields, (2) pasture irrigation areas, (3) two rapid infiltration basins (East and West) cumulatively covering 5.1 acres, or (4) emergency irrigation using the south sand field. Predominant disposal mechanisms are field irrigation and evapotranspiration from a 15-acre, 75-million gallon, unlined storage reservoir used to contain treated effluent when irrigation is unnecessary. If the storage reservoir reaches maximum capacity, excess treated wastewater discharges to the rapid infiltration basins.

Flood irrigation using treated effluent is conducted in accordance with an Effluent Management Plan (EMP), which must be submitted to, and approved by, the Nevada Division of Environmental Protection, Bureau of Water Pollution Control (BWPC) before beginning reuse irrigation activities. An EMP is included in the *City of Carlin Treatment Plant Upgrade Operations and Maintenance Manual* on file at the BWPC, received March 3, 1990, and approved July 2, 1990.

DISCHARGE CHARACTERISTICS

Wastewater for discharge is required to be treated to meet secondary treatment standards. Secondary treatment standards include discharge limitations on carbonaceous (inhibited) biochemical oxygen demand (CBOD), total suspended solids (TSS), and pH. Concentrations of total oxidized nitrogen and total kjeldahl nitrogen as nitrogen (as N) are required to be monitored and reported to track and correlate nitrogen compound concentrations in the effluent with concentrations observed at monitoring well locations. Effluent data reported for the 3rd (nitrogen species) and 4th quarters 2003 indicate the following typical discharge concentration ranges:

Inhibited BOD:	18 – 19 mg/L
Total Suspended Solids:	9 - 42 mg/L
pH:	7.6 – 9.0 SU
Total Oxidized Nitrogen:	<0.1 mg/L*
Total Kjeldahl Nitrogen:	5.9 mg/L*

*: Analyzed and reported once during each 2nd and 3rd quarter, annually.
mg/L: milligram per liter
SU: Standard Units

The facility has periodically exceeded discharge limitations since the permit was issued in 1999; however, documented occurrences appear random and episodic. For instance, since 2002, pH exceeded the upper limitation of 9.0 standard units (SU) in March 2002 (9.2 SU), April 2002 (9.4 SU), and April 2003 (9.4 SU). The discharge exceeded the CBOD limitation of 45 mg/L in May 2003 (49 mg/L). Similar discharge discrepancies occurred between 1999 and 2000, which were remedied through operational corrections and/or periodic system optimization.

RECEIVING WATER CHARACTERISTICS:

Treated effluent is discharged to groundwater of the State of Nevada. Discharge limitations to groundwater are based, in part, on primary drinking water standards adopted by the State of Nevada. The primary drinking water standard for nitrate as N is 10 mg/L.

Groundwater in the vicinity of the facility is relatively shallow, ranging from 1.3 to 18 feet below grade surface (bgs), depending on the location of the well and the season. The treatment facility, primary irrigation fields, and pastures are adjacent to the Humboldt River on the north side, while the storage reservoir, east and west rapid infiltration basins (RIBs), and sand field are immediately south of the Humboldt River.

Groundwater is monitored using five (5) wells located between discharge locations and the Humboldt River. Monitoring wells MW-1 and MW-2 are located between the West RIB and East RIB, respectively, and the Humboldt River. Monitoring wells MW-3, MW-4, and MW-5 are located immediately south of the West Irrigation Field, the Central Irrigation Field, and the East Irrigation Field, respectively, between the irrigation sites and the Humboldt River.

Groundwater characteristics for depth and nitrogen compound concentrations reported for 4th quarter 2003 and TDS and chloride concentrations reported for 3rd quarter 2003 are as follows[1]:

Well Location	Depth to Water (feet bgs)	TDS (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Kjeldahl Nitrogen (mg/L)	Total Nitrogen (mg/L)
MW-1	12.3	430	38	1.1	0.1	<1.2
MW-2	10.2	400	18	0.9	0.2	<0.4
MW-3	9.3	580	42	<0.05	0.4	<0.5
MW-4	6.6	910	200	2.4	.2	2.6
MW-5	5.4	960	120	<0.05	1	<1.1

PROPOSED LIMITATIONS:

[1] 4th quarter sample shipment error. Accumulations of snow precluded the collection of additional sample volume for TDS and chloride analyses.

During the period beginning on the effective date of this permit and lasting until the permit expires, the Permittee is authorized to discharge from:

Outfall 001: Treated wastewater from the City of Carlin Wastewater Treatment Facility to groundwater of the State of Nevada.

Confirmation samples or discharge parameter measurements shall be collected at the:

Influent: At the influent pump station (wet well pump);
Effluent: At the discharge of Lagoon Cell 2 prior to disposal; and
Irrigation: Prior to discharge for purposes of flood irrigation.

The discharge shall be limited and monitored by the Permittee as specified below:

Effluent Limitations

PARAMETERS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	30-Day Average	**Daily Maximum**	**Sample Location**	**Measurement Frequency**	**Sample Type**
Total Flow (mgd)	0.5	0.9	Influent	Continuous	Flow Meter
Irrigation Volume (gallons)	Monitor & Report		Irrigation	Monthly	Flow Meter/ Totalizer
Inhibited BOD (mg/L)	Monitor & Report		Influent	Monthly	Composite
Inhibited BOD (mg/L)	25	40	Effluent	Monthly	Composite
Inhibited BOD Treatment Efficiency (%)	85		-----	Monthly	Calculate
Total Suspended Solids (mg/L)	---	90	Effluent	Monthly	Composite
pH (SU)	6-9		Effluent	Monthly	Discrete
Nitrate as N (mg/L)	Monitor & Report		Effluent	Quarterly	Discrete
Total Nitrogen as N (mg/L)	Monitor & Report		Effluent	Quarterly	Discrete
Total Nitrogen as N Applied (pounds)	Monitor & Report		Irrigation	Quarterly	Calculation
Cumulative Annual Nitrogen Applied (pounds/acre-year) [1]	Monitor & Report		Irrigation	Annually	Calculation (cumulative)

mgd: million gallons per day
mg/L: milligrams per liter
as N: As nitrogen
BOD: Biochemical oxygen demand (inhibited refers to carbonaceous)
SU: Standard Units

Footnotes:

[1]: Annual nitrogen load is determined based on the nitrogen budget. The total annual nitrogen applied (lbs/acre/year) shall not be greater than the total annual nitrogen uptake (lbs/acre/year). Calculations and monitoring data shall use the **total nitrogen** in the applied wastewater (monitored by the treatment facility), total nitrogen from fertilizer applications, nitrogen uptake by crops or vegetation, evapotranspiration rate, precipitation rate, and fraction of applied nitrogen removed by denitrification and volatilization.

Quarterly accounting of nitrogen load is required to track and verify timely management of nitrogen application throughout the progression of a calendar year. Each quarter, the cumulative annual amount of total nitrogen applied (January through December) shall be increased by the incremental amount of nitrogen applied during the reported quarter. Data provided in the fourth quarter annual report must demonstrate compliance with the annual nitrogen load allocated under the Effluent Management Plan (January through December).

Rationale for Effluent Discharge Limitations:

- *Flow*: The treatment system design has been approved by the BWPC to effectively operate at this flow rate.
- *Inhibited (carbonaceous) Biochemical Oxygen Demand (BOD):* 25 mg/L 30-day average (52 pounds per day [#/day]) and 40 mg/L daily maximum (83 #/day). These limitations are secondary treatment standards.
- *Total Suspended Solids (TSS)*: 90 mg/L (675 #/day) 30-day average and daily maximum. This limitation is authorized for treatment systems using lagoons or ponds.
- *pH:* This limitation is a secondary treatment standard.
- *Nitrate as N:* This limitation is required to monitor the relative fraction of oxidized nitrogen in the effluent and for groundwater comparison purposes.
- *Total Nitrogen:* The concentration of total nitrogen in treated wastewater used for irrigation is required for purposes of determining mass discharge to irrigated areas. The nitrogen concentration in treated wastewater is a component of the calculation for quarterly nitrogen mass application, which is ultimately used to reconcile annual nitrogen budgets.

  The total nitrogen as nitrogen (as N) application rate and the annual nitrogen load (balance) are required under the EMP. Quarterly reconciliation of the nitrogen load is required so that facility operators can assess and optimize irrigation practices to effectively manage and routinely demonstrate projected compliance with the annual nitrogen load (balance) limitation.

Groundwater Monitoring:

Monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5 shall be sampled for the presence of nitrogen compounds, total dissolved solids (TDS), and chloride. Measurements of depth to groundwater and groundwater elevation will also be required on a quarterly basis. Wells shall be monitored in accordance with permit conditions and sampling and analysis protocol defined in the facility Operations and Maintenance (O&M) Manual.

Should long-term monitoring results or facility operation necessitate or warrant the installation of additional monitoring wells, all wells shall be incorporated into the required monitoring schedule. Subsequent monitoring wells installed shall be constructed in accordance with "WTS-4: Monitoring Well Design Requirements" (NDEP, February 1997). The installation and use of additional wells must be reported to the Division and amended to the groundwater monitoring program (requirements) as a minor modification to the permit.

Groundwater wells shall be monitored according to the following parameters:

Groundwater Monitoring Requirements

PARAMETER	LIMITATIONS	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE
Depth to Groundwater (feet)	Monitor & Report	Each Well	Quarterly	Field Measurement
Groundwater Elevation (feet above msl)	Monitor & Report	Each Well	Quarterly	Calculate
Total Nitrogen as N (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete
Nitrate as N (mg/L)	10	Each Well	Quarterly	Discrete
Chlorides (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete
Total Dissolved Solids (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete

msl: mean sea level
mg/L: milligram per liter
as N: as Nitrogen

If nitrate as nitrogen (as N) concentrations measured in groundwater increase to:

i. 7.0 mg/L, the Permittee shall notify the Division immediately (within 5-days of becoming aware of the condition), and within 30-days after notifying the Division, the Permittee shall submit a plan for the reduction of nitrogen in groundwater that includes a proposal for an alternative method of disposal. Modifications to the EMP shall be also contemplated and incorporated in an effort to improve discharge management practices which increase nitrogen uptake by vegetation and/or adjust other nitrogen sources. The plan and the revised EMP is subject to Division approval and must receive approval in order to satisfy this condition.

ii. 9.0 mg/L, the Permittee shall begin implementation of the plan and shall execute all corrective action necessary to ensure no further degradation of groundwater.

iii. 10.0 mg/L, the Permittee shall discontinue the use of reclaimed wastewater and the discharge to groundwater shall cease, unless otherwise authorized by the Division.

SCHEDULE OF COMPLIANCE:

Upon issuance, the Permittee shall implement and comply with the provisions of the permit and the following schedule of compliance, including in said implementation and compliance, any additions or modifications the Administrator may make in approving the schedule of compliance.

- **Upon issuance of the permit,** the Permittee shall achieve compliance with all discharge limitations; and,
- **Within 45 days of the permit issue date *(date),*** the Permittee shall submit an updated O&M Manual prepared in accordance with guidance document *WTS-2: Minimum Information Required for an Operations and Maintenance Manual*. The updated O&M Manual must:

  i. Include sampling and analyses protocol relevant for samples collected to demonstrate compliance with the permit;

  ii. Include an updated Effluent Management Plan, developed in general accordance with the guidance document *WTS-1B: General Criteria for Preparing an Effluent Management Plan*;

  iii. Include provisions for vector attraction controls;

  iv. Describe and define sludge handling and management procedures; and

  v. Be stamped by a Professional Engineer licensed in the State of Nevada.

PROPOSED DETERMINATION:

The Division has made the tentative determination to issue (renew) the proposed permit for a 5-year period. In accordance with Nevada Administrative Code (NAC) 445A.232, this discharge is classified under the category of a *Discharge of Domestic Wastewater 500,000 gallons or more but less than 1,000,000 gallons daily.*

PROCEDURES FOR PUBLIC COMMENT:

Notice of the Division's intent to issue a permit authorizing the facility to discharge to groundwater of the State of Nevada, subject to the conditions contained within the permit, is being sent to the **Elko Daily Free Press** for publication. Notice is also mailed to interested persons on our mailing list and contacts for pumping wells identified within 7,000-feet of the discharge. Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice, and must be postmarked, faxed, or e-mailed by 5:00 p.m. on **October 4, 2004**. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant; any affected State; any affected interstate agency; the Regional Administrator; or any interested agency, person, or group of persons. The request must be filed within the comment period, indicate the interest of the person filing the request, and cite the reasons why a hearing is warranted. Public hearings granted by the Division are conducted in accordance with NAC

445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: Tamara Pelham
August 31, 2004
P:\BWPC\BWPC Permits\NV and NEV\NEV93001 Carlin\2004\ NEV93001FS proposed